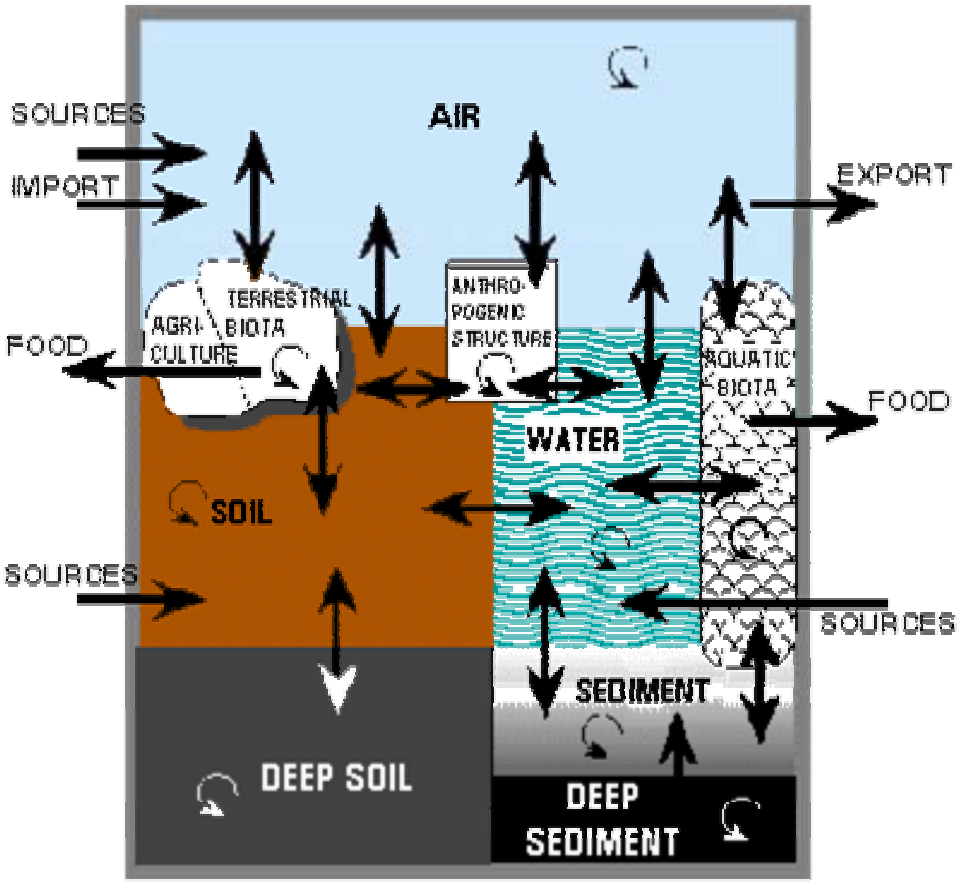
Dioxin Monitoring in the San Francisco Bay Area

Mark Stoelting, BAAQMD, 9/18/02

Dioxin Reservoirs and Interaction



FLUXES AMONG DIOXIN RESERVOIRS

- Dioxin reservoir buildup mainly since WW II
- Dioxin compounds are long-lived
- Toxic exposure primarily through food intake
- Limited dioxin ambient air monitoring conducted prior to the 1990s

National Dioxin Air Monitoring Network (NDAMN)

- National monitoring program sponsored by EPA
- Background levels and trends
- Model evaluation for transport and deposition
- Evaluate ambient dioxin levels in agricultural areas
- Monitoring network to include 31 rural sites
- Began operating in June 1998 with nine sites

Bay Area NDAMN Site

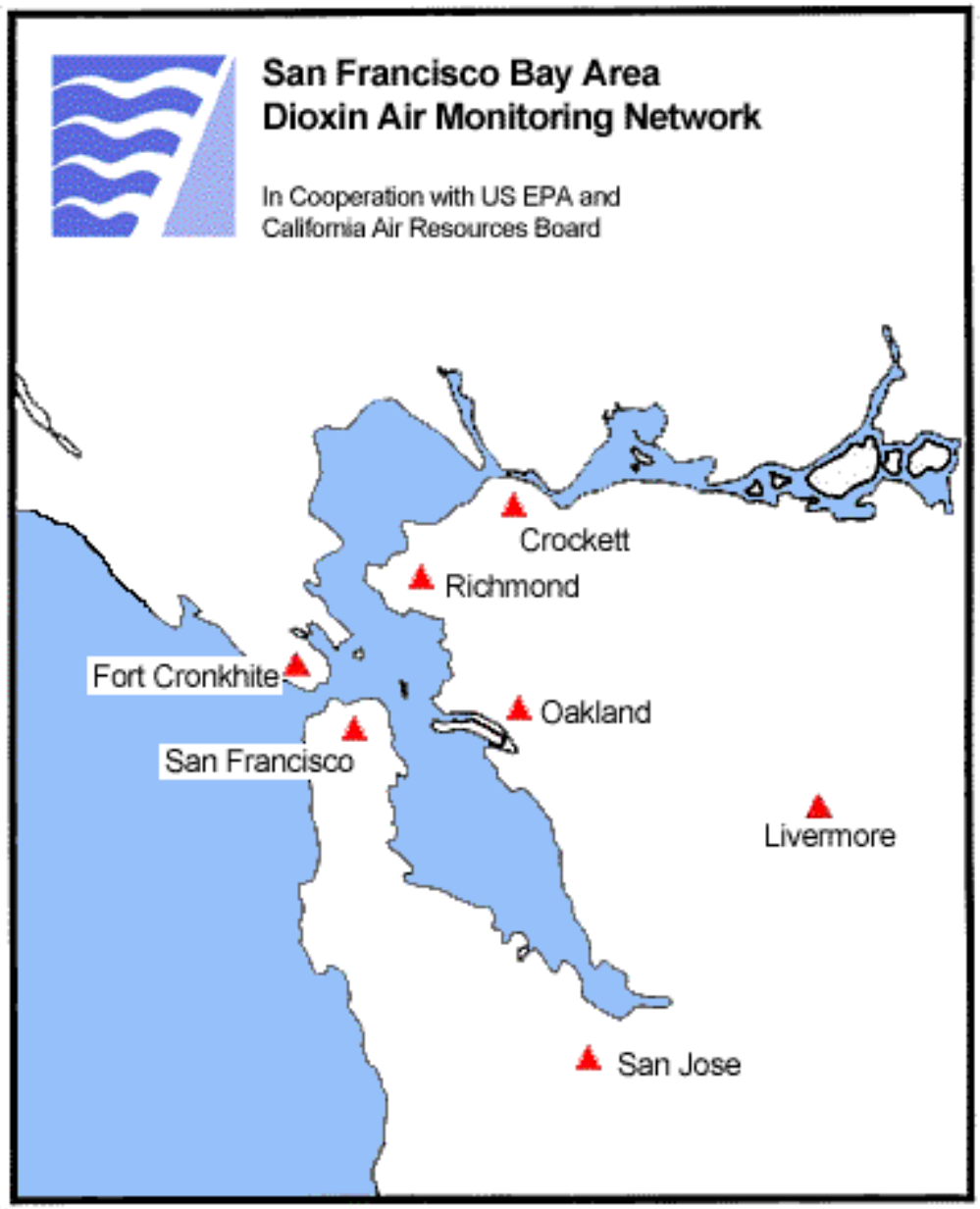
- Monitoring site located at Ft. Cronkhite in the Golden Gate National Recreation Area in Marin Co.
- Strong Pacific Ocean influence with occasional urban influence during E and SE winds
- Collect four sample moments each year
- Sampling began in November 2000

San Francisco Bay Area Dioxin Air Monitoring Network

- Pilot sampling project in the Bay Area
- Cooperative effort between EPA Region IX, California Air Resources Board (CARB), and Bay Area AQMD
- Follows NDAMN sampling schedule at Ft. Cronkhite (four sample moments/year)

Bay Area Sampling Sites

- Sampling sites include Ft. Cronkhite (NDAMN), San Jose, Rancho Seco (25 mi SE of Sacramento), Richmond, San Francisco, and Oakland
- A total of 17 samples were collected from November 2000 through November 2001
- Sample analysis conducted at the EPA's Environmental Chemistry Lab at the Stennis Space Center in Mississippi
- Analysis schedule impacted by 9/11


San Francisco Bay Area
Dioxin Air Monitoring Network
In Cooperation with US EPA and
California Air Resources Board
Crockett
Richmond
Fort Cronkhite
Oakland
San Francisco
Livermore
San Jose

California ARB CADAMP Network

- California Ambient Dioxin Air Monitoring Program
- Urban dioxin measurements in the San Francisco and Los Angeles areas
- Five Bay Area sites: Richmond, Oakland, and San Jose, plus Crockett and Livermore
- Continuous sampling with 13 four-week sampling moments per year
- Two-year program ends December 2003

Additional San Francisco Dioxin Sampling

- One additional year of sampling for San Francisco funded by EPA grant
- Sampling will match the CADAMP schedule during CY 2003

Dioxin Sampler

Measured Analytes

CDD Congener	CDF Congener	Coplanar PCB (IUPAC #)
2378-TCDD	2378-TCDF	(77) 3,3',4,4'-TCB
12378-PeCDD	12378-PeCDF	(126)3,3',4,4',5-PeCB
123478-HxCDD	23478-PeCDF	(169)3,3',4,4',5,5'-HxCB
123678-HxCDD	123478-HxCDF	(105)2,3,3',4,4'-PeCB
123789-HxCDD	123678-HxCDF	(118)2,3',4,4',5-PeCB
1234678-HpCDD	123789-HxCDF	(156)2,3,3',4,4',5-HxCB
12346789-OCDD	234678-HxCDF	(167)2,3,3',4,4'5-HxCB
	1234678-HpCDF	.
	1234789-HpCDF	
	12346789-OCDF	
Total TetraCDD	Total TetraCDF	
Total PentaCDD	Total PentaCDF	
Total HexaCDD	Total HexaCDF	
Total HeptaCDD	Total HeptaCDF	
Total PCDD	Total PCDF	

Analyte Detection Limits

- **Dioxins/furans**
  - **Remote: 0.1 fg/m^3**
  - **Rural: 0.5 fg/m^3**
- **Coplanar PCBs**
  - **Remote: 0.3 fg/m^3**
  - **Rural: 0.5 fg/m^3**

In order to meet these detection limits, it is necessary to sample 6000 – 8000 m^3 of air

Needle in the Haystack

- fg = femtogram or one quadrillionth
- Current National Debt is approximately $6.2 trillion
- Analyte detection limit is approximately 0.001% of one cent compared to the National Debt

Dioxin Information Web Links

- Bay Area AQMD: http://www.baaqmd.gov/dioxins
- California ARB – CADAMP information: http://www.arb.ca.gov/aaqm/qmosopas/dioxins/dioxins.htm
- EPA – NDAMN information: http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=22423